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ABSTRACT

The field of education has largely ignored the concept of the dialectic, except in the Socratic teaching method, and even there bipolar meaning or reasoning has not been recognized. Mainstream educational psychology bases its assumptions about human reasoning and learning on current demonstrative concepts of information processing and levels of processing. Three current strategies based on these assumptions are serial listing of facts or topics; cause/effect relationships; and problem/solution methods. Research has shown that recall of prose passages is significantly greater with dialectical (or opposing points of view) methods compared to the other three learning strategies. Individual differences in the use of dialectical methods represent production deficiencies rather than lack of capacity. If metacognition, the process of knowing about knowing, is to be a viable concept, it must transcend cognition, i.e., be "otherwise". Metacognitive capacities therefore imply dialetical rather than demonstrative reasoning. Studies of learning disabled students have shown that such students evidenced deficits in this metaknowledge (knowing when one knows) relative to regular students. Future research may show that the conceptualization problems of the learning disabled are related to the lack of use of dialectical reasoning. (MCF)

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EDUCATIONAL APPLICATIONS OF THE DIALECTIC: THEORY AND RESEARCH

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Educational Applications of the Dialectic:

Theory and Research

APA Presentation, 1983--Dialectic Symposium

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The field of education is no different from the areas of psychology already discussed. The concept of the dialectic has been largely ignored--except in the so-called Socratic teaching method--and even here bipolar meaning or reasoning has not been recognized, merely the importance of dialogue and questions in the classroom (cf., Collins, 1977). I propose today to examine the implications of a dialectically reasoning human in education. I view this as merely the practical extension of the conceptions and research just presented on learning and personality (see Rychlak, 1977). First, I will examine the current assumptions of most educators and educational psychologists regarding human reasoning and meanings. Second, I will present some of the research which tests dialectical reasoning in educational contexts. Third, I will discuss the implications of this theory and research for education, especially teaching strategies and text organizations. And finally, I would like to make a few comments on a particularly hot topic in education right now, metacognition, and describe what I feel is its intimate relationship to the dialectic.

It almost goes without saying that mainstream educational psychology bases its assumptions about human reasoning and learning on current demonstrative conceptions in cognitive

science, such as information processing and levels of processing. The learner, therefore, is regarded as a sophisticated computer with a certain mechanistic nature (or hardware) and a determining nurture (or software), with which the person must act in demonstrative consonance. The objective of teaching and good text presentation, then, is to input programming which is demonstratively logical. The implicit assumption is that the best way to make the information relevant to the living machine is to organize it with demonstrative characteristics. An educational psychologist who writes and researches textbooks once confided in me that the facts themselves rarely seemed to have "logical" connections, especially in psychology, but he felt that the text author should present the facts as if they did (or "lie" as he put it), so that the reader will understand and because we know that knowledge will eventually be logically consistent. There is another assumption here which I believe reflects mainstream education. Not only is it assumed that the learner is demonstrative in nature, but that knowledge itself is (or will be) demonstratively related.

The clear implication, of course, is that text and teaching strategies should present ideas in this manner. There are currently three main demonstrative organizations, or "top level" structures as they are called, which are used to this end. They in turn represent other implicit assumptions related to demonstrative logic.

1) serial listing of facts or topics--Knowledge is

considered to be factually based and linear, either logically or chronologically.

2) cause/effect--All knowledge is or will be knowledge of causes and effects "out there."

3) problem/solution--This is a demonstrative method of knowledge collection. Why not "collect" it in the mind in the same way?

The problem is that if some of the theory and research you heard from the other symposium participants were true, much of the ideas being presented to the learner would be bi- (or multi-) polar in nature and not syllogistic or sequential. This would imply that some information cannot be understood unless juxtaposed against alternate poles of meaning, whether in presentation by the teacher or as spontaneously generated by the learner. In addition, the learners would be dialectical as well as demonstrative reasoners. Educators would not be taking full advantage of the students' capacities, especially those relating to creativity and critical thinking. Consequently, the aforementioned "top level" structures would not be as effective in drawing out the relations of many ideas as a dialectical or opposing points of view format.

This is precisely the findings of a study by Meyer and Freedle (1979). Although the study was not premised in this theoretical manner, these investigators constructed prose passages using the three demonstrative structures I just described and the "dialectical" or opposing points of view format. The four passages had identical ideas and information,

an equal number of words, and the same "lower level" structure (as ensured by a prose analysis procedure). However, when presented to randomly assigned students, significantly more information was learned, both in short term and long term recall, from the dialectically organized passage than from any other. Why?

One inference we can draw from this is that it is very difficult to conceptualize many ideas without the other pole of their meaning. Some of my students tell me that they had never really understood behaviorism until after my class on humanism. They report having had a rote memory or even an application level of understanding of behaviorism before, but they had not understood this conception qua conception until it was contrasted with another pole of its meaning. I should note parenthetically that the best students have already generated some form of contrast on their own. This, I believe, suggests a possible individual difference dimension to this construct, viz., the ability to use dialectic meanings in conceptualization, and I will return to this dimension momentarily.

My example so far has been that of college students. Let me illustrate the effectiveness of the dialectic in elementary education. A student of mine conducted an informal study involving the learning of mathematics. Math, I found out, is not typically taught in elementary schools; arithematic is. Mathematics pertains to the concepts underlying the computational skills which are arithematic. This is perhaps another measure of the pervasive influence of demonstrative logic in elementary

education, i.e., the fact that demonstrative-type skills of computation are taught prior to any notion of the meanings of the computation, which I will contend are dialectical in nature.

We hypothesized that the conceptions of addition and subtraction were dialectically related. My student solicited the help of a teacher she knew to substitute the arithematic lesson for a mathematics lesson for those students just being introduced to either subject. This informal study had few controls, but the comments by the teachers and her students were interesting. Apparently, as soon as her students understood the concepts of order, magnitude, etc.--concepts underlying addition--it seemed to the teacher as if "most students already understood the concepts underlying subtraction." Whereas before, she had always "pulled apart" this bipolarity and taught the two computational skills separately, she now "for the first time saw how addition and subtraction were the same thing" and so did her children. She also commented on the difference between the students who understood <u>why</u> they were doing arithematic and those who did not. She concluded that math should precede arithematic, rather than the reverse. The main point, however, is her own demonstrative assumptions and her own astonishment at the dialectical nature of the two previously considered, unipolar meanings.

I would like to turn now to the point mentioned previously concerning individual differences. You may have noticed that this teacher said <u>most</u> of her children already understood subtraction. The word "most" denotes the individual differences

we are seeing in our data regarding the use of the dialectic. Before presenting some of that data, a word of caution: Our assumption here is that the dialectic is a part of human nature, every human nature. I do not view those student who "already knew" subtraction as dialectical and those who did not as not possessing dialectical reasoning. I believe, instead, that these individual differences reflect, what is labeled in the educational psychology literature as, "production deficiencies." That is, instead of viewing the children as lacking the capacity, all children are considered to be able to reason from pole to pole, but some choose not to "produce" such reasoning, hence a production deficiency.

In order to test the possibility that such individual differences existed, John Rickards and I (1982) borrowed the serial listing and dialectically organized passages from the Meyer and Freedle (1979) study. We gave them to introductory psychology students in the upper and lower quartiles of Rokeach's (1960) Dogmatism scale. We hypothesized that students low in dogmatism (or "openmindedness") would probably recall more ideas from the dialectical than from the serial passage, while the student high in dogmatism would recall more ideas from the listing then from the dialectic passage. We felt this would be true, largely because of the research showing that individuals low in dogmatism tended to process information more "deeply," looking for relations and implications. Individuals high in dogmatism, on the other hand, tend to process the surface quality of information only, and do not attend to conceptual structure

and relations. The results supported an interaction of the sort we hypothesized, as well as a main effect the type of prose organization, replicating the finding of Meyer and Freedle that oppositional structure is generally superior in promoting recall.

There was also evidence that even the highly dogmatic students grasped better the implications of the ideas in the dialectic passage, though their recall scores were lower. One could speculate that poorer students in general would eventually benefit the most from the juxtaposition of contrasting sets of ideas, since the better students would be more able to generate such relations on their own. We broke the subjects down by GPA and found statistical trends to support this.

This brings me to some of the more applied work being done on dialectical presentation in the college classroom. If you think over the texts that you have recently used, reviewed, or written, you will probably see one of the demonstrative organizations I described as implicit. This seems especially true of introductory psychology books, where the authors, more often than not, want psychology to look logical and systematic, and certainly not oppositional and unsettled. Joe Rubinstein and I recently edited a book (Rubinstein & Slife, 1982) which can be used as a supplement to a conventional text. It contains articles pro and con on different issues in psychoogy and has been used successfully in debate and panel discussion formats or merely as a backdrop to lectures.

Another participant of the symposium, Rich Williams, and I recently completed an investigation of the dialectical

arrangement of the book. We had a third of my introductory students read the regular pro and con set of articles, a third read two pro articles, a third read two con articles. These conditions were counterbalanced issue by issue, and the students were tested on their knowledge of each article by essay and multiple-choice items. A formal analysis has not been performed, but the array of means looks promising. We hypothesized, of course, that the dialectic conditions would show higher scores than the demonstrative conditions. We also hypothesized that the brightest students in the demonstrative, pro/pro and con/con, conditions would generate the contrasting pole of meaning themselves in order to conceptualize the information being read. To find this out, we tested them on the information from the nonread articles. Conversely, we reasoned that the poorer students would benefit the most from the explicit presentation of the two poles of meaning. Again, a formal analysis has not been conducted, but this gives you a flavor for the current theory and research.

If you will now permit me to shift conceptual gears a bit, I would like to close my discussion with a few comments regarding metacognition vis a vis the dialectic. As I mentioned, there has been a flurry of educational research on metacognition in the past few years. I would like to make the contention that a conception of metacognition requires the dialectic.

For those of you who are unfamiliar with the concept, let me give you a brief introduction. "Cognition" is, of course, a process of knowing, but "metacognition" is considered the process

of knowing about such knowing. Consistent with the assumptions I described earlier, metacognition is viewed in education as a mechanistic, demonstratively logical process which monitors cognition--another mechanistic, demonstrative process. The interrelation of cognition and metacognition is similar to two computers (or circuits) on the same line; one has the job of monitoring the functions of the other via a feedback loop.

Not surprisingly, many prominent researchers have wondered whether metacognition will become merely another part of cognition (e.g., Wertsch, 1979). There are also complaints that metacognition still does not do away with the necessity of a homunculus in mentation (e.g., Brown, 1980). The concept of metacognition is not only one of monitoring, but the ability to control cognition or thinking in light of such monitoring. The mechanistic, demonstrative models do not seem to allow this. Of course, the very notion of feedback presumes that the master program is already in place (see Weizenbaum, 1980). Demonstrative logic likewise presumes that "primary and true" premises are being logically extended. Consequently, the feedback conception can never capture the initial decision to begin a sequence of processing; feedback occurs only <u>after</u> the mechanism is already committed to a processing sequence. A homunculus is therefore necessary to alter this "master programming." The problem is that the control of such cognitive operations was the original impetus for the construct of metacognition. The researcher is back at square one.

One of the beauties of the dialectic is that it does away

with homunculi. If one has the ability to take more than one position on the same life experience, then different premises or "master programs" can be affirmed. In this sense, metacognition can not only monitor in a mechanistic manner the mind's own thought processes, it can also put them to question. In other words, even master programs can be challenged and other processing sequences acted on. The key is the insight from the dialectic that when we know we are thinking something, we also must know that we could be thinking otherwise. That is, to know is to know an "otherwise." I was just discussing research which supported the corollary of this, viz., if we do not know the "otherwise," we have not understood.

If metacognition is to be a viable concept, it must be able to transcend cognition. This, afterall, is what "meta" implies. It must go beyond the usual flow of thinking and see thoughts occurring from the vantage point of an observer outside this flow. To be "outside the flow" is, by definition, to know the limits of the particular thought (A) being observed and thereby understand what "not A" is (i.e., the "otherwise"). A mechanism that is feeding back output as new input does not transcend and know that it is feeding back. It never gets outside of its own processing to know that is a process of knowing. Metacognitive capacities therefore imply dialectical rather than demonstrative reasoning, and do so without invoking homunculus conceptions.

The first step, I feel, in empirically testing these assertions is to show that "control processes" such as metacognition exist independently of what is currently considered

as cognition, viz., as storer and retriever of experience. The human mind has a capacity to be outside the flow of experience and have an "otherwise." I just finished analyzing a study which attempted to do just that.

Analogous to studies of affective assessment where the impact of the construct was shown despite controls on previous experience or "cognition" in this context (Rychlak, 1977), I also attempted to show the impact of metacognition on two populations, learning disabled and regular students, who had shown reliable differences in metacognitive skills, while they were equated on relevant cognitive factors. "Knowing when one knows" was operationalized as knowing when an arithematic problem was solved correctly or incorrectly. Learning disabled children evidenced deficits in this metaknowledge relative to regular students, as predicted, and did so despite having precisely the same cognitive abilities, achievement, and performance in the problem set. This is not a dialectical study per se, but it does give some construct validity to metacognition as an theoretical entity separate from cognition. My guess is that subsequent studies will show that the conceptualization problems inherent in learning disabled children are related to the lack of use of dialectical reasoning. In any case, the studies I have just reviewed seem to augur well for a program of research along these lines.

In summary, it is difficult for me to understand such findings from the models currently influential in education. If the LD and regular students were cognitively equivalent, how

could they differ in their knowledge about their cognition unless they did have the ability to be outside the flow--or--have a dialectical "otherwise." In the study of pro and con articles, how could the single presentation of A and not-A promote better understanding about A than the double presentation of A? Frequency of exposure and contiguity are the keys to learning in demonstrative frameworks. One would have to hold that these oppositions are contiguously and frequently presented to make any sense of these results, and past and present demonstrative practices in education make this possibility very remote.

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